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Dated: August 6, 2007, 2007
Electronic Signature for Stefan D. Osterbur: /Stefan D. Osterbur/

Docket No.: 66774-0004
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent Application of:
Daniel J. Wilkinson

Application No.: 10/605,988

Confirmation No.: 2987

Filed: November 12, 2003

Art Unit: 3676

For: PISTON RING ASSEMBLY

Examiner: V. A. Patel

REPLY BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Honorable Sir:

This is a Reply Brief submitted pursuant to 37 CFR § 41.41 in response to the Examiner's Answer dated June 6, 2007 (hereinafter the "Examiner's Answer"). The Examiner's Answer responded to Appellants' Appeal Brief, filed March 5, 2007 (hereinafter the "Appeal Brief").

This Reply Brief has been prepared by the counsel who originally submitted this Application and the responses for previous Office Actions. It is respectfully submitted that the Examiner, as with previous Office Actions regarding this Application, has not shown every element recited in the independent claims. For the benefit of the Board, and in light of the Examiner's Answer, various diagrams and arguments submitted in previous Office Actions are included below to properly explain why the pending claims are patentable over the prior art of record.

ARGUMENT

i. Rejections under 35 U.S.C. §102 and Fall

Claims 1-3, 6, 7 and 17 have been rejected under 35 U.S.C. § 102(b) as anticipated by Fall (U.S. Patent No. 2,349,903). Appellant respectfully traverses this rejection, again pointing out that independent claims 1 and 9 each recite the limitation “wherein radial compression of said upper and lower rings induces axial expansion” of the claimed expander. This limitation is neither disclosed nor suggested anywhere within Fall.

First, Fall does not state that its expander ring undergoes axial expansion. According to the Examiner, “Fall teaches that the expansion of the expander in an axial direction *is possible* as noted on page 1, lines 33-37 due to compression of the upper and lower rings.” Office Action at 3 (emphasis added). Fall does not state that *axial* expansion is possible. The portion of Fall referenced by the Examiner reads as follows:

The ring 15 is split at 15c in order that it may expand or contract as required by the ring segments 10 and 11 and the cylinder 14 in which the piston assembly is being used.

Fall at 1:33-37. The referenced text merely says that the ring 15 may expand or contract, without referring to either the radial or axial direction. Further, as explained further below, Fall’s disclosure clearly indicates that the referenced expansion is radial, not axial.

Given the foregoing, the only possible basis for the Examiner’s assertion that Fall discloses the claimed expander is that Fall somehow *inherently* discloses an axially expanding expander ring. However, the Examiner concedes that--at most--such axial expansion “is possible.” Thus, even if the Examiner’s characterization were correct, Fall does not satisfy the legal standard for inherent anticipation. Under established Federal Circuit precedent, “Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” *MEHL/Biophile Int’l Corp. v. Milgram*, 192 F.3d 1362, 1365, 52 USPQ2d 1303 (Fed. Cir. 1999) (emphasis added) (citations omitted); *see also Transclean Corp. v. Bridgewood Services*, 290 F.3d 1364, 1373, 62 USPQ2d 1865 (Fed. Cir. 2002) (“anticipation by inherent disclosure is appropriate only when the reference discloses prior art that *must necessarily* include the unstated limitation”) (emphasis added); Manual of Patent Examining Procedure (“MPEP”) § 2112, IV (“The fact that a certain

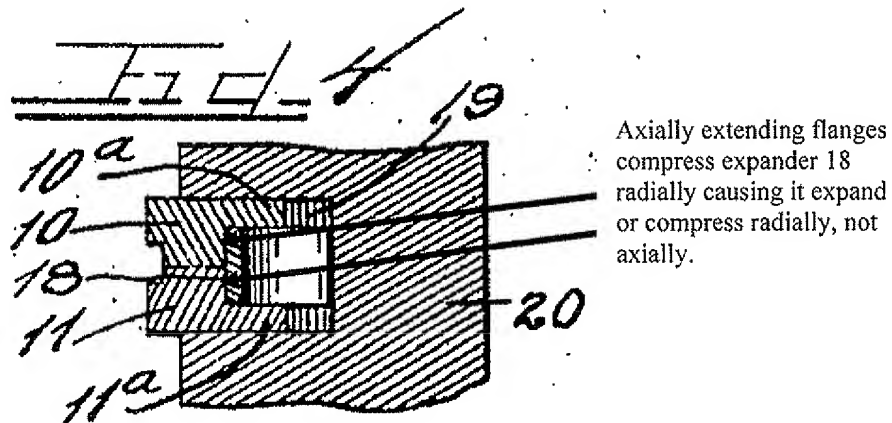
result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic”) (original emphasis). Accordingly, Fall does not inherently anticipate the claimed invention.

Second, contrary to the Examiner’s assertion, nothing in Fall suggests that axial expansion of expander ring 18 “is possible.” To the contrary, Fall expressly states that its expander ring expands radially, as opposed to axially. In support of his rejection, the Examiner relies on the embodiment of Figure 4 from Fall. “The expander ring 18 [of Figure 4] is similar to the expander ring 15 in the form of the invention shown in Figures 1, 2, and 3, but is considerably narrower.” Fall at column 3, lines 15-18. As shown in Figure 1, expander ring 15 has radially directed “corners 15b . . . bearing against the back of the main portions of the ring segments 10 and 11.” Fall at column 2, lines 30-33. Fall describes the expansion of its expander ring as follows:

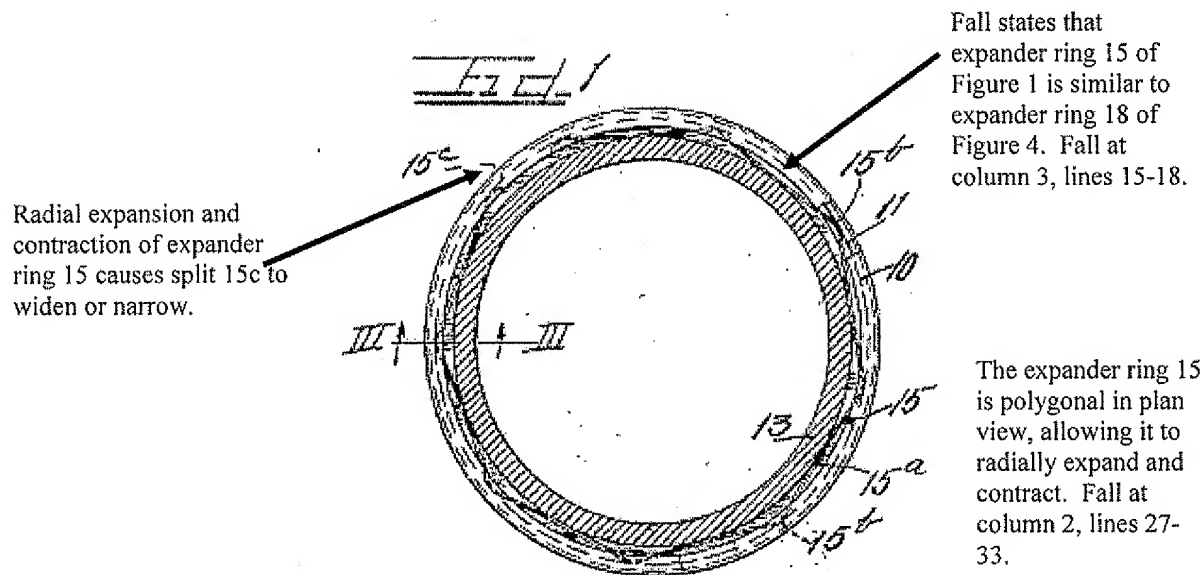
[T]he corners 15b bear against the ring segments 10 and 11, thus pressing the ring segments 10 and 11 radially outwardly with respect to the piston 13. With this arrangement, the exact pressure that may be desired between the ring segments 10 and 11 and the cylinder wall 14 may be secured, and this pressure will be uniformly distributed around the entire circumference of the ring segments.

Fall at column 2, lines 40-48 (emphasis added).

In response to Appellant’s foregoing arguments, the Examiner contends that “Because the split of the expander *is capable* of being made relatively small and large, axial compression is necessary to do this.” See Office Action dated 8/28/2006, page 6 (emphasis added). Appellant respectfully disagrees. As shown in Fall’s Figure 4, ring segments 10 and 11 include axially extending flange portions that abut expander ring 18 in the radial direction (below).



As a result, the radial compression of rings 10 and 11 induces radial compression of expander ring 18, which constricts the expander ring and affects the size of its split, as shown in Fall's Figure 1:



According to the Examiner, Fall inherently anticipates the rejected claims because "the lower ring and the expander have the same structure as claimed by applicants." This logic is flawed, and ignores the functional limitation included with each independent claim. While Appellants admit that the rejected claims have certain structural features in common with Fall. However, those similarities do not establish inherent anticipation. The rejected claims recite "wherein radial compression of said upper and lower rings induces axial expansion of said

expander.” There is no basis for assuming that Fall will satisfy this limitation simply because it has certain structural features in common with Appellant’s claims.

In the Examiner’s Answer, the Examiner cites paragraph [0021], lines 7-16 of Appellant’s specification, which states:

“The radial compression of the upper and lower rungs 12, 14 induces axial expansion of the expander 22, causing the two generally parallel ends 47a, 47b defining the expander gap to mate.”

The Examiner further states that “this is what is taught by Fall as shown in figure 1 below,” citing Fall at Page 1, column 2, lines 33-37. See Examiner’s Answer, page 7. As described above, Fall states that any expansion is in a radial direction (i.e., in the plane of the page that illustrates Figure 1 of Fall), as opposed to “axial expansion” (i.e., orthogonal to the plane of the page that illustrates Figure 1 of Fall) as recited in claims 1 and 9. The clear meaning of paragraph [0021] and [0022] of Appellant’s specification is that another effect of the radial (i.e., in the same plane as the general ring shape of expander ring 22) compression of the upper and lower rings may be the mating of ends 47a, 47b of the expander ring, in addition to the axial (i.e., generally orthogonal to the plane of the general ring shapes of expander ring 22) expansion of expander ring 22. More specifically, paragraph [0022] of the Specification states:

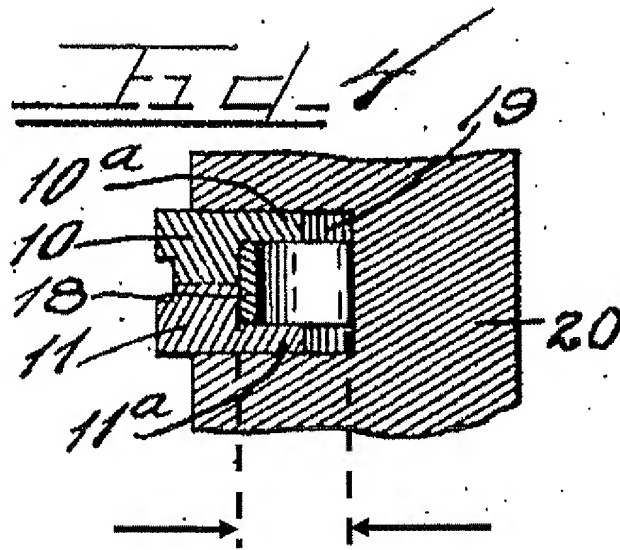
As seen in Figure 5, upon further axial expansion the expander 22 buckles, resulting in an increased force between the alternating apexes 44 of the expander 22 and the first and second shoulder recesses 16, 18 of the upper and lower rings 12, 14. Accordingly, the upper ring 12 is urged against the upper surface 48 of the ring groove 34, while the lower ring is urged against the lower surface 50 of the ring groove 34. The passageways 60 previously existing between the piston ring assembly 10 and the upper and lower surfaces 48, 50 of the ring groove 34 are minimized or eliminated. Furthermore, the inner periphery of the expander 22 is pressed into contact with the piston 36, thereby eliminating the passageway 60 between the expander 22 and the base surface 52. Therefore, oil and gases are prevented from escaping between the piston ring assembly 10 and the ring groove 34 through the passageway 60, thereby resulting in a more effective seal than conventional ring assemblies.

As this passage clearly indicates, “axial expansion” of the expander ring generally tends to urge the upper and lower rings apart, increasing the general effectiveness of the assembly in sealing

oil. The Examiner appears to be interpreting Appellant's specification to define "axial expansion" as movement by the expander ring in a direction in the same plane as the general ring shape of the expander ring 22, in conflict with the clearly intended meaning of "axial" expansion as used throughout Appellants specification and claims, and as commonly understood and generally used by one of ordinary skill in the art in regard to piston ring applications. Further, such an interpretation would render Appellant's invention inoperable, as it would fail to urge the upper and lower rings against upper surface 48 and lower surface 50, respectively, as described in paragraph [0022]. As the Examiner has not issued any rejection under Section 101 or Section 112, the Examiner has implicitly acknowledged the clearly intended meaning of the independent claims.

Accordingly, Fall does not expressly or inherently disclose each limitation of the rejected it claims, and therefore cannot anticipate them. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

Dependent claims 2, 3, 6, 7, and 17 each depend from independent claim 1, and are therefore allowable over Fall for at least the same reasons as those discussed above. Moreover, the independent claims recite independently patentable subject matter. Merely by way of example, claim 17 recites that the expander has a radial thickness that is greater than the radial width of the claimed cavity. Fall does not disclose or suggest this limitation. Nevertheless, the Examiner asserts that "[t]he radial thickness of the expander (expander has a radial thickness starting from inside of the cavity and extending to the piston, example is shown in Figure 1) is greater than the radial thickness of the cavity." See Office Action dated 8/28/2006, page 3. Appellant respectfully disagrees. The "cavity" of claim 17 is defined by a first recess in the upper ring and the second recess defined in the lower ring (see claim 9). While Fall's rings 10 and 11 may have recesses that define a cavity, expander 18 does not have a thickness that is greater than the radial thickness of the cavity, as shown in Fall's Figure 4:



Width of cavity defined by rings 10 and 11 is
the same as "radial thickness" of expander 18

Nothing in Fall indicates that expander 18 has a radial thickness that is greater than the radial thickness of the cavity. The Examiner contends that expander 18 has a radial thickness "extending to the piston." Nevertheless, at most Figure 4 indicates that the radial thickness of the expander is the same--not greater than--that of the cavity.

ii. Rejections under 35 U.S.C. §103 and Fall, Landon, and Weurfel

The Examiner has rejected claims 4, 9-10, 12-13, and 15-16 and 18 under 35 U.S.C. §103(a) as being allegedly unpatentable over Fall in view of Landon. The Examiner has further rejected Claims 5 and 11 under 35 U.S.C. §103(a) as being allegedly unpatentable over Fall and Landon. Claim 8 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Fall in view of U.S. Patent No. 20,256 to Weurfel (hereinafter "Wuerfel"). Finally, Claim 14 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Fall and Landon, in view of Wuerfel. These rejections are respectfully traversed. As Appellants have previously argued, the combined references do not disclose or suggest--either expressly or inherently--each

feature of the rejected claims.

Independent Claims 1 and 9

Independent claims 1 and 9 each recite “wherein radial compression of said upper and lower rings induces axial expansion of said expander.” For the reasons mentioned above, Fall does not disclose or suggest this limitation. Landon fails to cure this shortcoming of Fall. Landon discloses a corrugated spacer member 3 positioned between two “relatively flat upper and lower oil-control members.” Landon, column 2, lines 9-30. Because of the orientation of spacer member 3, it “exhibits some axial resilience.” Landon, column 2 lines 35-37. However, nothing in Landon suggests that its flat control members can be radially compressed to induce axial expansion of corrugated spacer member 3. The Examiner asserts that “the expander of Landon is capable of being compressed to induce axial expansion.” Regardless of whether the expander is theoretically capable of being compressed to induce axial expansion, claim 4 recites that “***radial compression of said upper and lower rings induces*** axial expansion of the expander.” Landon’s flat control members cannot be radially compressed to induce the axial expansion of spacer member 3. Moreover, the Examiner concedes that—at most—it *is possible* to operate Landon’s device to induce axial expansion. While Appellant disagrees with the Examiner’s characterization of Landon, such a theoretical possibility is insufficient to reject Appellant’s claims. *MEHL/Biophile Int’l Corp. v. Milgraum*, 192 F.3d 1362, 1365, 52 USPQ2d 1303 (Fed. Cir. 1999). Accordingly, the combined references do not disclose or suggest each limitation of the rejected claims, and therefore, do not render the claims obvious.

In addition, the Examiner has not properly established a motivation or suggestion in the prior art for combining Fall and Landon. The Examiner contends that it “would have been obvious . . . to have the expander of Fall replaced by the expander of Landon, to provide axial

resilience for the expander, a substantial bearing area of the upper and lower rings and to minimize wear.” See Office Action dated 8/28/2006, page 4. However, one of ordinary skill in the art would not be motivated to replace Fall’s expander with that of Landon for several reasons. First, as explained above, the purpose of Fall’s expander 18 is to “press[] the ring segments 10 and 11 radially outwardly with respect to the piston 13” so that “pressure will be uniformly distributed around the circumference of the ring segments.” Fall at column 3, lines 42-48. However, because Landon’s space member 3 is axially corrugated, it would not provide the radial pressure that Fall requires. Thus, if Fall and Landon were combined in the manner suggested by the Examiner, Fall would not work for its intended purpose. *See In re John R Fritch*, 972 F.2d 1260, 1265 n.12 (Fed. Cir. 1992) (“This court has previously found a proposed modification inappropriate for an obviousness inquiry when the modification rendered the prior art reference inoperable for its intended purpose”). Replacing Fall’s expander 18 with Landon’s space member 3 would frustrate an expressly stated purpose of Fall’s expander--to provide a uniform circumferential distribution of pressure around ring segments 10 and 11. Thus, one of ordinary skill in the art would not be motivated to make the substitution proposed by the Examiner.

Second, Landon teaches that its expander must be at least as radially thick as its upper and lower rings (“Likewise rings which use a spacer having a radial depth less than that of the control segments do not have the desired action, regardless of the materials employed”). Landon at column 2, lines 42-46. In contrast, Fall’s upper and lower rings 10 and 11 are radially thicker (see flanges 10a and 11a) than expander ring 18. Thus, the combination of Fall and Landon would require a selective combination and redesign of the references which is not motivated or suggested by the prior art. *See In re Ratti*, 270 F.3d 810, 813 (C.C.P.A. 1959).

The Examiner's Answer states that "Appellants' argument that teaching of London [sic] would make the Fall invention inoperable is not persuasive because London is used to teach that the expander to have [sic] apexes that contact the upper and lower rungs and being a generally sinusoidal expander to provide axial resilience for the expander and a substantially bearing area of the upper and lower rings to minimize wear." See Examiner's Answer, page 9. The Examiner similarly states that "Appellants' argument of selective combination is not persuasive because London is used to teach that the expander to have [sic] apexes that contact the upper and lower rungs and being a generally sinusoidal expander to provide axial resilience for the expander and a substantially bearing area of the upper and lower rings to minimize wear." See Examiner's Answer, page 9. These statements are unresponsive to Appellant's arguments, described above, that specifically point out why Fall and Landon would not have been combined by one of ordinary skill in the art at the time the invention was made. The Examiner must explain with specificity why one of ordinary skill in the art at the time the invention was made would ignore certain teachings of a reference, while selecting other teachings from the same reference, in combining the reference with other prior art.

Dependent Claims

Dependent claims 4, 5, 8, 10-16, and 18 each depend from independent claims 1 and 9, and are therefore patentable over the prior art of record for at least the same reasons as described above in regard to claims 1 and 9. Moreover, the dependent claims recite independently patentable subject matter that is neither taught nor suggested by the prior art of record.

Merely by way of example, claim 18 recites that the expander has a radial thickness that is greater than the radial thickness of the claimed cavity. As explained above, Fall does not disclose this feature. Moreover, Figure 3 of Landon clearly indicates that the radial thickness of

spacer member 3 is less than that of the cavity in which it is disposed. As a result, the combined references do not disclose or suggest the additional features of claim 18.

CONCLUSION

In view of the foregoing arguments, a reversal of the rejections of record is respectfully requested of this Honorable Board. Appellant believes that no fee is due with this Reply Brief. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. 66774-0004, from which the undersigned is authorized to draw. To the extent necessary, a petition for extension of time under 37 C.F. R. § 1.136 is hereby made, the fee for which should be charged to the above account.

Respectfully submitted,

Dated: August 6, 2007

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